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(11) **EP 0 764 608 B1**

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
04.04.2001 Bulletin 2001/14

(51) Int Cl.7: **B68G 9/00**

(21) Application number: **95307882.1**

(22) Date of filing: **06.11.1995**

(54) **Pocket coil spring structure assembling apparatus**

Zusammenbau von Taschenschraubenfedereinheiten

Dispositif d'assemblage d'une structure à ressorts ensachés

(84) Designated Contracting States:
CH DE ES GB IT LI

(30) Priority: **21.09.1995 JP 24323495**

(43) Date of publication of application:
26.03.1997 Bulletin 1997/13

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Description

BACKGROUND OF THE INVENTION

[0001] The present invention relates to coil springs for use in upholstery furnitures or cushioned seats and more specifically, to an apparatus for producing a so-called pocket coil spring structure which comprises rows of enclosures or pockets, each pocket containing therein a coil spring.

[0002] Conventional coil springs used in a mattress or chair are joined to one each other by C-shaped rings and mounted on the base of the mattress or chair.

[0003] However, the joining the coil springs to each other with the C-shaped rings requires a considerable length of time and labor and is thus low in the productivity. Also, the conventional coil springs produce unpleasant scratching noise when they are ground by each other or the C-shaped rings in use, thus degrading the quality of the mattress or chair.

[0004] For overcoming the foregoing drawback, a method has been developed, for example, as disclosed in Japanese Patent Laid-open Publication 2-20346 (1990), which comprising the steps of accommodating each coil spring in a pocket (enclosure) made of an unwoven material, assembling and placing a row of the pockets in their upright state on a planer base, pressing from above the row of the pockets, applying a spray of an adhesive on to the side of each pocket of the row, and bonding another row of the pockets to the row of the adhesive applied pockets to form a so-called pocket.

[0005] In a pocket coil spring structure assembling apparatus embodying the method, the coil springs in the pockets remain held down from above during application of sprays of the adhesive with a spray nozzle. This causes the pockets to be undulated on surface as their coil springs being pressed down.

[0006] The undulated surfaces of the pockets of which coil springs are compressed are then coated with sprays of an adhesive and joined with another row of the pocket coil springs. If crests of the undulated surfaces of each pocket coil spring where the adhesive is applied fail to meet those of the succeeding pocket coil spring to be joined, the two pocket coil springs may successfully be joined to each other. This will result in declination of the quality of life of the pocket coil spring structure.

[0007] Particularly, when the coil springs have a barrel shape enlarged radially in the middle, their pockets are joined to each other at points and the above predicament will be more critical.

[0008] It is an object of the present invention, in view of the above predicament, to join rows of pocket coil springs to one another with ease and certainty for forming at a higher efficiency a pocket coil spring structure of improved quality and durability.

[0009] A pocket coil spring structure assembling apparatus is described in EP-A-0421495 for producing a pocket coil spring structure of upholstery furniture by

5 bonding rows of pocket coil springs to one another, each pocket coil spring consisting mainly of a coil spring accommodated in a tubular enclosure of a pocket form made of a non-woven or fabric material, comprising a feeder mechanism for supplying a group of the pocket coil springs to a positioning transfer conveyor; a positioning transfer conveyor mechanism for conveying the group of the pocket coil springs supplied from the feeder mechanism to a predetermined location; a cutter mechanism mounted between the feeder mechanism and the positioning transfer conveyor mechanism for separating a group of the pocket coil springs from the succeeding pocket coil springs by cutting to a given length; a spray mechanism for applying a spray of an adhesive material to the group of the pocket coil springs; and a controller mechanism for controlling each of the mechanisms.

10 [0010] The invention is characterised by a press holding mechanism for holding and lifting the group of pocket coil springs on the positioning transfer conveyor by pressing the radial centre of each pocket coil spring from both sides; a press holding mechanism carrier mechanism for moving the press holding mechanism in four, forward, backward, leftward, and rightward direction; and a nozzle carrier mechanism for moving a spray nozzle.

15 [0011] The feeder mechanism may comprise a plurality of radially extending separate feeder plates mounted at equal intervals on a rotary shaft which is disposed in parallel to a support plate and driven by a drive device.

20 [0012] The positioning transfer conveyor mechanism may be arranged to travel at a speed slightly faster than the feeding speed of the feeder mechanism.

25 [0013] The positioning transfer conveyor mechanism may have a multiplicity of positioning members mounted at equal intervals on a conveyor belt thereof.

30 [0014] The cutter mechanism may be disposed between the feeder mechanism and the positioning transfer conveyor mechanism.

35 [0015] The press holding mechanism may be arranged to carry a group of the pocket coil springs with holding arms from the positioning transfer conveyor mechanism to the inlet of the shooter in phase with or ½ out of phase from the preceding group of the pocket coil springs. This allows the groups of pocket coil springs to be selectively joined to one another in either a zigzag or a parallel relationship.

40 [0016] The press holding mechanism may have a multiplicity of positioning members mounted to the lower side of a press holding plate thereof for determining the correct locations of the pocket coil springs of the group.

45 [0017] The spray nozzle of the spray mechanism may be arranged to apply downward sprays of the adhesive material and the nozzle carrier mechanism is arranged to move the spray nozzle from one end to the other end of the group of the pocket coil springs seated in the inlet of the shooter, without disturbing any other mechanism, for applying sprays of the adhesive material in a succession or intermittently at given time intervals. The group

of the pocket coil springs seated in the inlet of the shooter are coated with sprays of the adhesive material from the spray nozzle and moved downwardly along the shooter upon being joined with a succeeding group of the pocket coil springs coming from above.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018]

Fig. 1 is full perspective view of a pocket coil spring structure assembling apparatus according to the present invention;

Fig. 2 is a partially cutaway side view showing a primary part of the apparatus;

Fig. 3 is a partially cutaway front view showing a press holding mechanism, a press holding mechanism carrier mechanism, and a positioning transfer conveyor mechanism of the apparatus;

Fig. 4 is a partially cutaway perspective view of a row of groups of pocket coil springs according to the present invention;

Fig. 5 is a partially cutaway plan view showing a pocket coil spring structure in the groups of the pocket coil springs are joined to one another in a parallel form; and

Fig. 6 is a partially cutaway plan view showing a pocket coil spring structure in the groups of the pocket coil springs are joined to one another in a zigzag form.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0019] A pocket coil spring structure assembling apparatus of the present invention will be described in details referring to the accompanying drawings.

[0020] Fig. 1 is a full perspective view of the pocket coil spring structure assembling apparatus which, as denoted by 1, is designed for assembling multiple rows of pocket coil springs with an adhesive to form a pocket coil spring structure.

[0021] The pocket coil spring structure assembling apparatus 1 comprises a feeder mechanism 5 provided with a set of separate feeder plates 4 for feeding groups of pocket coil springs 3 along and on a support base 2, a positioning transfer conveyor mechanism 6 driven by its exclusive driving means for conveying the pocket coil springs 3 fed with the feeder mechanism 5 to a predetermined location, a cutter mechanism 7 mounted between the feeder mechanism 5 and the positioning transfer conveyor mechanism 6 for separating the pocket coil springs 3 into groups, a press holding mechanism 9 for press holding, lifting, and releasing the pocket coil springs 3 on a conveyor belt 8, a press holding mechanism carrier mechanism 10 for carrying the press holding mechanism 9 in four, forward, backward, leftward, and rightward, directions, a spray mechanism 66 provided

with a spray nozzle 15 for applying an amount of an adhesive 14 on to the pocket coil springs 3 located in the inlet 13a of a shooter 13 which is composed of a product support 12 and a slide product support 11, as best shown in Fig. 2, a nozzle carrier mechanism 16 for locating the spray nozzle 15, and a controller mechanism 17 for controlling the action of each prescribed mechanism.

[0022] The support plate 2 of the feeder mechanism 5 is mounted on a support frame 18 so that the pocket coil springs 3 in lying are conveyed with their coil spring axes extending horizontally. The support frame 18 is fixedly mounted at one end to a main base frame 19. The separate feeder plates 4 are tightened to a rotary shaft 20 which is in turn mounted by bearings (not shown) for rotation to a pair of width-wisely spaced journal plates 21 and 22 mounted in upright on the support plate 2.

[0023] The rotary shaft 20 has a sprocket (not shown) mounted to one end thereof so that it can be driven by a motor mounted on the support frame 181 and of which rotating action is transmitted through a known transmission mechanism comprising a chain (not shown) installed between the sprocket on the rotary shaft 20 and an output shaft of the motor.

[0024] The separate feeder plates 4 are arranged radially at equal intervals on the peripheral surface of the rotary shaft 20. More particularly, the separate feeder plates 4 are designed in size and shape for each plate engaging a joint 26 between any two adjacent pocket coil springs to move the pocket coil springs 3 forward (See Fig. 3).

[0025] The conveyor belt 8 of the positioning transfer conveyor mechanism 6 extends from the forward end of the support plate 2 of the feeder mechanism 5. The conveyor belt 8 is so arranged in width and length as to support and convey each group of the pocket coil springs 3 received from the feeder mechanism 5 to a predetermined position as is driven by an exclusive motor (not shown).

[0026] The running speed of the conveyor belt 8 is regulated a bit faster than the feeding speed of the feeder mechanism 5. This allows the pocket coil springs 3 from the feeder mechanism 5 to be gently pulled at the interface between the feeder mechanism 5 and the conveyor mechanism 6 so that each non-spring pocket 23 joined between any two adjacent groups of the pocket coil springs 3 and accommodating non of the coil spring is easily cut off by the cutter mechanism 7 as tensioned when having been advanced to and halted at the interface.

[0027] Also, the conveyor belt 8 has a multiplicity of positioning members 25 mounted on the surface thereof at equal intervals for meeting one by one the joints 26 between the pocket coil springs 3 and conveying the pocket coil springs 3 correctly to the predetermined location regardless of any unmatched distance between the two adjacent pocket coil springs 3.

[0028] The positioning transfer conveyor mechanism

6 starts its action after the non-spring pocket 23 between the two pocket coil spring groups is cut off by the cutter mechanism 7 and its conveyor 8 carries a separated group of the pocket coil springs 3 to the predetermined position where they are held by the press holding mechanism 9.

[0029] The positioning action on the positioning transfer conveyor mechanism 6 may be selected from two different methods of detecting the front end of the group of the pocket coil springs 3 with a sensor (not shown) and of determining with a timer of the controller mechanism 7. A desired one of the positioning methods is employed depending on the conditions of the group of the pocket coil springs 3 including dimensions and orientation.

[0030] The cutter mechanism 7 between the feeder mechanism 5 and the positioning transfer conveyor mechanism 6 includes a cutter 28 provided with a cutter blade 27. The cutter 28 is supported by a base 29a which is fitted into a slide groove 29 for movement in two directions axially of the pocket coil spring.

[0031] The cutter 28 is driven for movement by a cylinder 30 which is fixedly mounted to the main base frame 19 and has a rod thereof coupled to the rear of the cutter 28.

[0032] The cutter mechanism 7 starts its action when the feeder mechanism 5 and the positioning transfer conveyor mechanism 6 are actuated and the center of the non-spring pocket between the two groups of the pocket coil springs 3 comes to and pauses at the slide groove 29.

[0033] As the cutter 28 is advanced by the action of the cylinder 30 with its cutter blade 27 rotating, it cuts along the center 31 of the non-spring pocket 23. After cutting, the cutter 28 is returned back to its start position while its cutter blade 27 stops rotating.

[0034] As shown in Figs. 2 and 3, the press holding mechanism 9 has multiple pairs of holding arms 32a and 32b for holding the radial center of each the pocket coil spring 3 on the conveyor belt 8 from both sides. The holding arms 32a and 32b are aligned at equal intervals and fixedly mounted in symmetry to two planer open/close strips 33a and 33b respectively by screws 36a and 36b. More specifically, the holding arms 32a and 32b are arranged so that they are displaced by the actions of the screws 36a and 36b to match the shape and size of the pocket coil springs 3.

[0035] The open/close strips 33a and 33b are joined to cylinder rods 35a and 35b of operating cylinders 34a and 34b respectively. The cylinders 34a and 34b are fixedly mounted to a cylinder mounting plate 38. When the cylinder rods 35a and 35b are actuated together, the holding arms 32a and 32b operate for opening and closing from both ends to hold the pocket coil springs 3.

[0036] A pressing plate 37 is fixedly mounted by screws (not shown) to the lower side of the cylinder mounting plate 38. Mounted to the lower side of the pressing plate 37 are a plurality of equally spaced posi-

tioning members 39 extending downwardly for fitting to the joints 26 between the pocket coil springs 3 to locate the pocket coil springs 3 with accuracy. The positioning members 39 can be moved for positional adjustment after loosening the screws.

[0037] The cylinder mounting plate 38 is joined to rods 41 of cylinders 40 fixedly mounted to a press holding mechanism support bar 42. The action of the cylinders 40 causes the press holding mechanism 9 to move upward and downward (See Fig. 3).

[0038] The press holding mechanism carrier mechanism 10 which drives the press holding mechanism 9 to move in four, forward, backward, leftward, and rightward, directions has two hangers 43 thereof disposed on the forward and backward ends of the press holding mechanism 9 for supporting both ends of the press holding mechanism support bar 42 of the press holding mechanism 9. A slider 44 and a cylinder 45 are fixedly mounted to each of the hangers 43. At each end, there is also a slider bed 46 tightened to an L-shaped member 47 which is fixedly coupled to a cylinder slider 48.

[0039] The distal end of the rod of the cylinder 45 is joined to one side of the L-shaped member 47. A rodless cylinder 49 extending at a right angle to the L-shaped member 47 is fixedly mounted to the main base frame 19. As the cylinder sliders 48 run along their respective rodless cylinders 49, the press holding mechanism 9 is moved leftward and rightward. The action of the cylinders 45 drives the press holding mechanism 9 to move forward and backward.

[0040] The spray mechanism 66 comprises a tank 50 accompanied with a geared pump (not shown) for supply of a flow of the molten adhesive, the controller 17 for controlling the temperature of the tank 50, a conduit 51, and the nozzle 15 as well as a sprayed form of the adhesive, the conduit 51 for feeding the flow of the adhesive from the tank 50 to the nozzle 15, an electromagnetic valve 52 for starting and stopping the spraying of the adhesive, and the nozzle carrier mechanism 16 for moving the nozzle 15 with the electromagnetic magnetic valve 52.

[0041] More particularly, the conduit 51 is connected at one end to the tank 50 and at the other end to the electromagnetic valve 52. The nozzle 15 is arranged extending downwardly from the electromagnetic valve 52. The electromagnetic valve 52 is fixedly mounted to a nozzle support 54 which is joined to a slider 55. There are a slider bed 57 fixedly mounted to a longitudinal beam 56 of the main base frame 19 and a motor 59 fixedly mounted to a motor mounting plate 58 (See Fig. 2).

[0042] The motor mounting plate 58 is also tightened to the beam 56 of the main base frame 19. An endless chain 60 is provided for running freely in a loop between two sprockets (not shown) and coupled at a portion to the nozzle support 54.

[0043] As a sprocket 59a mounted on the rotary shaft of the motor 59 drives the chain 60, the nozzle 15 and the electromagnetic valve 52 are moved allowing the

spraying of the adhesive toward all the pocket coil springs 3 of the group from front to rear. The spray mechanism 66 is disposed so as not to disturb the action of any other mechanism.

[0044] The action of the pocket coil spring structure assembling apparatus 1 having the foregoing arrangement will now be explained.

[0045] The procedure starts with the actuation of the feeder mechanism 5 and the positioning transfer conveyor mechanism 6. Upon the center of the non-spring pocket 23 between the two groups of the pocket coil springs 3 on the feeder mechanism 5 being advanced to the slide groove 29 of the cutter mechanism 7, the feeder mechanism 5 and the positioning transfer conveyor mechanism 6 are stopped and the cutter mechanism 7 is actuated to separate the two groups of the pocket coil springs 3 from each other.

[0046] As the cutting action of the cutter mechanism 7 is completed, the positioning transfer conveyor mechanism 6 starts again to convey the separated group of the pocket coil springs 3 on the conveyor 8 to the predetermined location where they are held by the press holding mechanism 9 and stops.

[0047] The positioning to the predetermined location is performed by any desired one of the two different method: detection of the front end of the group of the pocket coil springs 3 with a photoelectric sensor and locating with a timer, depending on the conditions of the pocket coil springs 3 including dimensions and orientation.

[0048] When the positioning transfer conveyor mechanism 6 stops its action, the cylinders 40 of the press holding mechanism 9 above the conveyor belt 8 cause the press holding mechanism 9 to move downward. Then, the cylinders 34a and 34b are actuated at the same time to close their respective holding arms 32a and 32b so that each pocket coil spring is pressed at the radial center from both sides and held by the distal ends of the corresponding holding arms 32a and 32b. This is followed by the upward action of the cylinders 40 to lift up the press holding mechanism 9.

[0049] As the press holding mechanism 9 is lifted up, the feeder mechanism 5 and the positioning transfer conveyor mechanism 6 start again to feed the succeeding group of the pocket coil springs 3. Simultaneously, the rodless cylinders 49 of the press holding mechanism carrier mechanism 10 are actuated to transfer the pocket coil springs 3 in the press holding mechanism 9 to the inlet 13a of the shooter 13 between the product support 12 and the slide product support 11.

[0050] The downward action of the cylinders 40 of the press holding mechanism 9 lowers and inserts the pocket coil springs 3 into the shooter 13 between the product support 12 and the slide product support 11. The cylinders 34a and 34b are actuated to open the holding arms 32a and 32b releasing the group of the pocket coil springs 3 and the press holding mechanism 9 is returned upwards by the action of the cylinders 40.

[0051] After the press holding mechanism 9 moves upward, it is returned to its location over the conveyor belt 8 by the action of the rodless cylinders 49 of the press holding mechanism carrier mechanism 10. Then, the nozzle carrier mechanism 16 of the spray mechanism 66 is actuated to apply a spray of the adhesive 14 to the upper side of each of the pocket coil springs 3 seated in the inlet 13a of the shooter 13.

[0052] Since the pocket coil springs 3 of the group are held and compressed at radial center thereof from both sides by the distal ends of the holding arms 32a and 32b, their pockets are kept tensioned at surface and thus bonded securely to the preceding group of the pocket coil springs 3 having the adhesive 14 applied at their uppermost and seated in the inlet 13a of the shooter 13. In case that the holding arms 32a and 32b are replaced with a pair of simple bars, the pocket coil springs 3 are fully compressed while being held by the bars hence causing their pockets to be undulated on the surface and prevented from closely bonding to the preceding pockets.

[0053] By repeating the above procedure, the groups of the pocket coil springs 3 are joined to one after another, through bonding one group of the pocket coil springs 3 to the preceding group having the adhesive 14 applied at their upper sides and seated in the inlet 13a of the shooter 13, to form a pocket coil spring structure shown in Fig. 5.

[0054] The press holding mechanism carrier mechanism 10 is also adapted to move forward and backward to a distance equal to a half the diameter of the pocket coil spring so that the groups of the pocket coil springs 3 are joined to one another in a zigzag form. If no forward or backward movement is permitted, parallel rows of the pocket coil springs are assembled.

[0055] More specifically, a pocket coil spring structure shown in Fig. 6 is produced by actuating the cylinders 45 of the press holding mechanism carrier mechanism 10 once every two cycles in synchronization with the transfer movement of the press holding mechanism 9 to the inlet 13a of the shooter 13.

[0056] By repeating the above procedure, the groups of the pocket coil springs 3 are joined to one another to form a pocket coil spring structure. Before starting assembling another pocket coil spring structure, the spray mechanism 66 and the nozzle carrier mechanism 16 are stopped when the current pocket coil spring structure has been finished.

50 EFFECT OF THE INVENTION

[0057] The pocket coil spring structure assembling apparatus of the present invention allows each group of the pocket coil spring to be separated by cutting to a given length with the cutter mechanism and held by pressing the radial center of each pocket coil spring from both sides with the press holding mechanism so that the pocket of the pocket coil spring is properly tensioned.

Accordingly, the surfaces of the pocket coil springs 3 become smooth but not undulated, and can thus be bonded securely by spots of the adhesive to the surfaces of the pocket coil springs 3 of the preceding group. As the prior art disadvantage that a group of pocket coil springs having the surfaces of pockets thereof wrinkled and undulated by compression and coated with an adhesive are unsuccessfully joined if crests of the undulated pocket surfaces fail to meet those of a succeeding group of the pocket coil springs is eliminated, both the quality and durability of a finished pocket coil spring structure will be increased.

[0058] The feeder mechanism in the pocket coil spring structure assembling apparatus comprises a number of the radially extending separate feeder plates mounted at equal intervals on the rotary shaft which is disposed in parallel to the support plate and driven by a drive device, thus allowing the pocket coil springs of the group to be definitely advanced by the rotation of the rotary shaft as each being sandwiched between the separate feeder plates. Also, a multiplicity of the positioning members are mounted at equal intervals on the conveyor belt of the positioning transfer conveyor mechanism so that the pocket coil springs can be conveyed without erratic displacement as seated between the positioning members. This will allow the group of the pocket coil springs to be transferred without mishandling to the location where a following action is executed.

[0059] Particularly, the positioning transfer conveyor mechanism is arranged to travel at a speed slightly faster than the feeding speed of the feeder mechanism while the cutter mechanism is disposed between the feeder mechanism and the positioning transfer conveyor mechanism. This allows groups of the pocket coil springs in a row to be pulled by the positioning transfer conveyor mechanism upon being transferred from the feeder mechanism so that a joint to be cut between any two adjacent groups is kept tensioned. Hence, a group of the pocket coil springs will easily be separated by the cutter mechanism from the other groups, thus eliminating any time loss derived from fault cutting actions and increasing the production of pocket coil spring structures with higher quality.

[0060] Furthermore, the press holding mechanism is arranged to carry a group of the pocket coil springs with its holding arms from the positioning transfer conveyor mechanism to the inlet of the shooter in phase with or 1/2 out of phase from the preceding group of the pocket coil springs, and adapted having a multiplicity of the positioning members mounted to the lower side of the press holding plate thereof for determining the correct locations of the pocket coil springs of the group. This allows the groups of the pocket coil springs to be selectively joined to one another in either a zigzag or a parallel relationship, depending on the usage of the pocket coil spring structure for e.g. a cushioned bed or seat. As the result, the pocket coil spring structures are uniform in resiliency and their cushioned furniture products includ-

ing beds and chairs will offer a higher quality.

[0061] The spray nozzle of the spray mechanism is arranged to apply downward sprays of the adhesive material and the nozzle carrier mechanism is arranged to move the spray nozzle from one end to the other end of the group of the pocket coil springs seated in the inlet of the shooter, without disturbing any other mechanism, for applying sprays of the adhesive material in a succession or intermittently at given time intervals. In action, the group of the pocket coil springs seated in the inlet of the shooter are coated with sprays of the adhesive material from the spray nozzle and moved downwardly along the shooter upon being joined with a succeeding group of the pocket coil springs coming from above. Hence, the bonding between the two groups of the pocket coil springs will be enhanced contributing to the higher durability of the pocket coil spring structure.

20 Claims

1. A pocket coil spring structure assembling apparatus (1) for producing a pocket coil spring structure of upholstery furniture by bonding rows of pocket coil springs (3) to one another, each pocket coil spring (3) consisting mainly of a coil spring accommodated in a tubular enclosure of a pocket form made of a non-woven or fabric material, comprising:
 - a feeder mechanism (5) for supplying a group of the pocket coil springs (3) to a positioning transfer conveyor;
 - a positioning transfer conveyor mechanism (6) for conveying the group of the pocket coil springs (3) supplied from the feeder mechanism (5) to a predetermined location;
 - a cutter mechanism (7) mounted between the feeder mechanism (5) and the positioning transfer conveyor mechanism for separating a group of the pocket coil springs (3) from the succeeding pocket coil springs by cutting to a given length;
 - a spray mechanism (66) for applying a spray of an adhesive material to the group of the pocket coil springs (3); and
 - a controller mechanism (17) for controlling each of the mechanisms;
 characterised by:
 - a press holding mechanism (9) for holding and lifting the group of pocket coil springs (3) on the positioning transfer conveyor by pressing the radial centre of each pocket coil spring from both sides;
 - a press holding mechanism carrier mechanism (10) for moving the press holding mechanism in four, forward, backward, leftward, and rightward direction; and
 - a nozzle carrier mechanism (16) for moving a

spray nozzle (15).

2. A pocket coil spring structure assembling apparatus (1) as claimed in claim 1, wherein the feeder mechanism (5) comprises a plurality of radially extending separate feeder plates (4) mounted at equal intervals on a rotary shaft (20) which is disposed in parallel to a support plate (2) and driven by a drive device. 5
3. A pocket coil spring structure assembling apparatus as claimed in claim 1 or 2, wherein the positioning transfer conveyor mechanism (6) is arranged to travel at a speed slightly faster than the feeding speed of the feeder mechanism (5). 10
4. A pocket coil spring structure assembling apparatus (1) as claimed in any one of claims 1, 2, or 3, wherein the positioning transfer conveyor mechanism (6) has a multiplicity of positioning members (25) mounted at equal intervals on a conveyor belt (8) thereof. 15
5. A pocket coil spring structure assembling apparatus (1) as claimed in any one of claims 1 to 4, wherein the cutter mechanism (7) is disposed between the feeder mechanism (5) and the positioning transfer conveyor mechanism (6). 20
6. A pocket coil spring structure assembling apparatus (1) as claimed in claim 1, wherein the press holding mechanism (9) is arranged to carry a group of the pocket coil springs (3) with holding arms (32a, 32b) from the positioning transfer conveyor mechanism (6) to the inlet (13a) of a shooter (13) in phase with or ½ out of phase from the preceding group of the pocket coil springs. 25
7. A pocket coil spring structure assembling apparatus (1) as claimed in claim 1 or 6, wherein the press holding mechanism (9) has multiplicity of positioning members (39) mounted to the lower side of a press holding plate (37) thereof for determining the correct locations of the pocket coil springs of the group. 30
8. A pocket coil spring structure assembling apparatus (1) as claimed in claim 1, wherein the spray nozzle (15) of the spray mechanism (66) is arranged to apply downward sprays of the adhesive material and the nozzle carrier mechanism (16) is arranged to move the spray nozzle from one end to the other end of the group of the pocket coil springs (3) seated in the inlet (13a) of a shooter (13), without disturbing any other mechanism, for applying sprays of the adhesive material in a succession or intermittently at given time intervals. 35

Patentansprüche

1. Taschenschraubenfeder-Montagevorrichtung (1) zum Herstellen einer Taschenschraubenfederstruktur für Polstermöbel durch Verbinden von Reihen von Taschenschraubenfedern (3) miteinander, wobei jede Taschenschraubenfeder (3) hauptsächlich aus einer Schraubenfeder besteht, die in einem taschenartigen röhrenförmigen Gehäuse aufgenommen ist, welches aus einem nicht gewebten Material oder einem Fasermaterial besteht, enthaltend:
 - eine Zuführeinrichtung (5) zum Zuführen einer Gruppe von Taschenschraubenfedern (3) zu einem Positioniertransfer-Förderer,
 - eine Positioniertransfer-Fördereinrichtung (6) zum Transportieren der von der Zuführeinrichtung (5) zugeführten Gruppe von Taschenschraubenfedern (3) zu einer vorbestimmten Stelle,
 - eine Schneideinrichtung (7), die zwischen der Zuführeinrichtung (5) und der Positioniertransfer-Fördereinrichtung angeordnet ist, um eine Gruppe von Taschenschraubenfedern (3) von den nachfolgenden Taschenschraubenfedern durch Schneiden auf eine gegebene Länge zu trennen,
 - eine Sprüheinrichtung (66) zum Aufsprühen eines Klebermaterials auf die Gruppe von Taschenschraubenfedern (3) und
 - eine Steuereinrichtung (17) zum Steuern der einzelnen Einrichtungen,
 - gekennzeichnet durch:
 - eine Preßhalteeinrichtung (9) zum Halten und Anheben der Gruppe von Taschenschraubenfedern (3) auf der Positioniertransfer-Fördereinrichtung durch Pressen der radialen Mitte jeder Taschenschraubenfeder von beiden Seiten aus,
 - eine Trägereinrichtung (10) für die Preßhalteeinrichtung zum Bewegen der Preßhalteeinrichtung in die vier Richtungen, vorwärts, rückwärts, links und rechts, und
 - eine Düsenträgereinrichtung (16) zum Bewegen einer Sprühdüse (15).
2. Taschenschraubenfeder-Montagevorrichtung (1) nach Anspruch 1, bei der die Zuführeinrichtung (5) mehrere sich radial erstreckende, getrennte Zuführplatten (4) enthält, welche in gleichen Abständen auf einer Drehwelle (20) angebracht sind, die parallel zu einer Trägerplatte (2) angeordnet ist und die durch eine Antriebseinrichtung angetrieben wird.
3. Taschenschraubenfeder-Montagevorrichtung (1) nach Anspruch 1 oder 2, bei der die Positioniertransfer-Fördereinrichtung (6)

so angeordnet ist, daß sie mit einer Geschwindigkeit geringfügig schneller als die Zuführgeschwindigkeit der Zuführeinrichtung (5) arbeitet.

4. Taschenschraubenfeder-Montagevorrichtung (1) 5
nach einem der Ansprüche 1, 2 oder 3,
bei der die Positioniertransfer-Fördereinrichtung (6)
mehrere Positionierelemente (25) aufweist, die in
gleichen Abständen an deren Förderband (8) ange-
bracht sind. 10
5. Taschenschraubenfeder-Montagevorrichtung (1)
nach einem der Ansprüche 1 bis 4,
bei der die Schneideinrichtung (7) zwischen der Zu-
fuhreinrichtung (5) und der Positioniertransfer-För-
dereinrichtung (6) angeordnet ist. 15
6. Taschenschraubenfeder-Montagevorrichtung (1)
nach Anspruch 1,
bei der die Preßhalteeinrichtung (9) so angeordnet 20
ist, daß sie eine Gruppe von Taschenschraubenfe-
dern (3) mit Haltearmen (32a, 32b) von der Positio-
niertransfer-Fördereinrichtung (6) zu dem Einlaß
(13a) einer Schießeinrichtung (13) in Phase mit
oder um 1/2 Phase gegenüber der vorausgehenden 25
Gruppe von Taschenschraubenfedern versetzt för-
dert.
7. Taschenschraubenfeder-Montagevorrichtung (1)
nach Anspruch 1 oder 6,
bei der die Preßhalteeinrichtung (9) mehrere Posi-
tionierelemente (39) aufweist, die an der Unterseite
einer Preßhalteplatte (37) zum Bestimmen der kor-
rekten Stellungen der Taschenschraubenfedern der 30
Gruppe montiert ist. 35
8. Taschenschraubenfeder-Montagevorrichtung (1)
nach Anspruch 1,
bei der die Sprühdüse (15) der Sprüheinrichtung
(66) angeordnet ist, um das Klebematerial durch
Sprühen nach unten aufzubringen, und bei der die 40
Düsenträgereinrichtung (16) angeordnet ist, um die
Sprühdüse von einem Ende zu dem anderen Ende
der Gruppe von Taschenschraubenfedern (3) zu
bewegen, die in dem Einlaß (13a) einer Schießein-
richtung (13) angeordnet ist, wobei keine andere 45
Einrichtung gestört wird, um das Klebematerial kon-
tinuierlich oder in vorgegebenen zeitlichen Abstän-
den aufzusprühen. 50

Revendications

1. Appareil d'assemblage de structures à ressorts hé-
licoïdaux en pochette 55
(1) pour produire une structure à ressorts hélicoï-
daux en pochette de mobilier à capitonnage en re-
liant des rangées de ressorts hélicoïdaux en po-

chette (3) les unes aux autres, chaque ressort hé-
licoïdal en pochette (3) se composant principale-
ment d'un ressort hélicoïdal logé dans une envelop-
pe tubulaire en forme en pochette fabriquée en non-
tissé ou en tissu, comprenant :

un mécanisme d'avancement (5) destiné à pré-
senter un groupe de ressorts hélicoïdaux en
pochette (3) à un transbordeur de
positionnement ;
un mécanisme transbordeur de positionne-
ment (6) destiné à transporter le groupe de res-
sorts hélicoïdaux en pochette (3) présentés par
le mécanisme d'avancement (5) jusqu'à un em-
placement prédéterminé ;
un mécanisme de coupe (7) monté entre le mé-
canisme d'avancement (5) et le mécanisme
transbordeur de positionnement (6) pour sépa-
rer un groupe des ressorts hélicoïdaux en po-
chette (3) des ressorts hélicoïdaux en pochette
suivants en le coupant à une longueur donnée ;
un mécanisme de pulvérisation (66) destiné à
pulvériser un jet de matière adhésive sur le
groupe de ressorts hélicoïdaux en pochette
(3) ; et
un mécanisme contrôleur (17) destiné à con-
trôler chacun des mécanismes ;
caractérisé par :
un mécanisme de préhension par pressage (9)
destiné à tenir et soulever le groupe de ressorts
hélicoïdaux en pochette (3) sur le transbordeur
de positionnement en pressant le centre radial
de chaque ressort hélicoïdal en pochette par
les deux côtés ;
un mécanisme porteur du mécanisme de pré-
hension par pressage (10) destiné à déplacer
le mécanisme de préhension par pressage
dans quatre directions, à savoir avant, arrière,
gauche et droite ; et
un mécanisme porteur de buse (16) destiné à
déplacer une buse de pulvérisation (15).

2. Appareil d'assemblage de structures à ressorts hé-
licoïdaux en pochette (1) selon la revendication 1,
dans lequel le mécanisme d'avancement (5) com-
prend une pluralité de plateaux d'avancement sé-
parés s'étendant radialement (4) montés à interval-
les égaux sur un arbre rotatif (20) qui est disposé
parallèlement à un plateau de support (2) et entraî-
né par un dispositif d'entraînement.

3. Appareil d'assemblage de structures à ressorts hé-
licoïdaux en pochette (1) selon la revendication 1
ou 2, dans lequel le mécanisme transbordeur de po-
sitionnement (6) est agencé de façon à fonctionner
à une vitesse légèrement plus élevée que la vitesse
d'avancement du mécanisme d'avancement (5).

4. Appareil d'assemblage de structures à ressorts hélicoïdaux en pochette (1) selon l'une quelconque des revendications 1, 2 ou 3, dans lequel le mécanisme transbordeur de positionnement (6) comporte une multitude d'éléments de positionnement (25) montés à intervalles égaux sur une bande transporteuse (8) de celui-ci. 5
5. Appareil d'assemblage de structures à ressorts hélicoïdaux en pochette (1) selon l'une quelconque des revendications 1 à 4, dans lequel le mécanisme de coupe (7) est disposé entre le mécanisme d'avancement (5) et le mécanisme transbordeur de positionnement (6). 10 15
6. Appareil d'assemblage de structures à ressorts hélicoïdaux en pochette (1) selon la revendication 1, dans lequel le mécanisme de préhension par pressage (9) est agencé de façon à transporter un groupe de ressorts hélicoïdaux en pochette (3) avec des bras de préhension (32a, 32b) depuis le mécanisme transbordeur de positionnement (6) jusqu'à l'entrée (13a) d'une glissière (13) en phase avec le groupe précédent de ressorts hélicoïdaux en pochette ou en demi-déphasage par rapport à celui-ci. 20 25
7. Appareil d'assemblage de structures à ressorts hélicoïdaux en pochette (1) selon la revendication 1 ou 6, dans lequel le mécanisme de préhension par pressage (9) comporte une multitude d'éléments de positionnement (39) montés sur le côté inférieur d'un plateau de préhension par pressage (37) de celui-ci pour déterminer les emplacements exacts des ressorts hélicoïdaux en pochette du groupe. 30 35
8. Appareil d'assemblage de structures à ressorts hélicoïdaux en pochette (1) selon la revendication 1, dans lequel la buse de pulvérisation (15) du mécanisme de pulvérisation (66) est agencée de façon à pulvériser vers le bas des jets de matière adhésive et le mécanisme porteur de buse (16) est agencé pour déplacer la buse de pulvérisation d'une extrémité à l'autre extrémité du groupe de ressorts hélicoïdaux en pochette (3) logés dans l'entrée (13a) d'une glissière (13), sans gêner un quelconque autre mécanisme, pour pulvériser des jets de matière adhésive successivement ou par intermittence à des intervalles de temps déterminés. 40 45 50 55

Fig.1

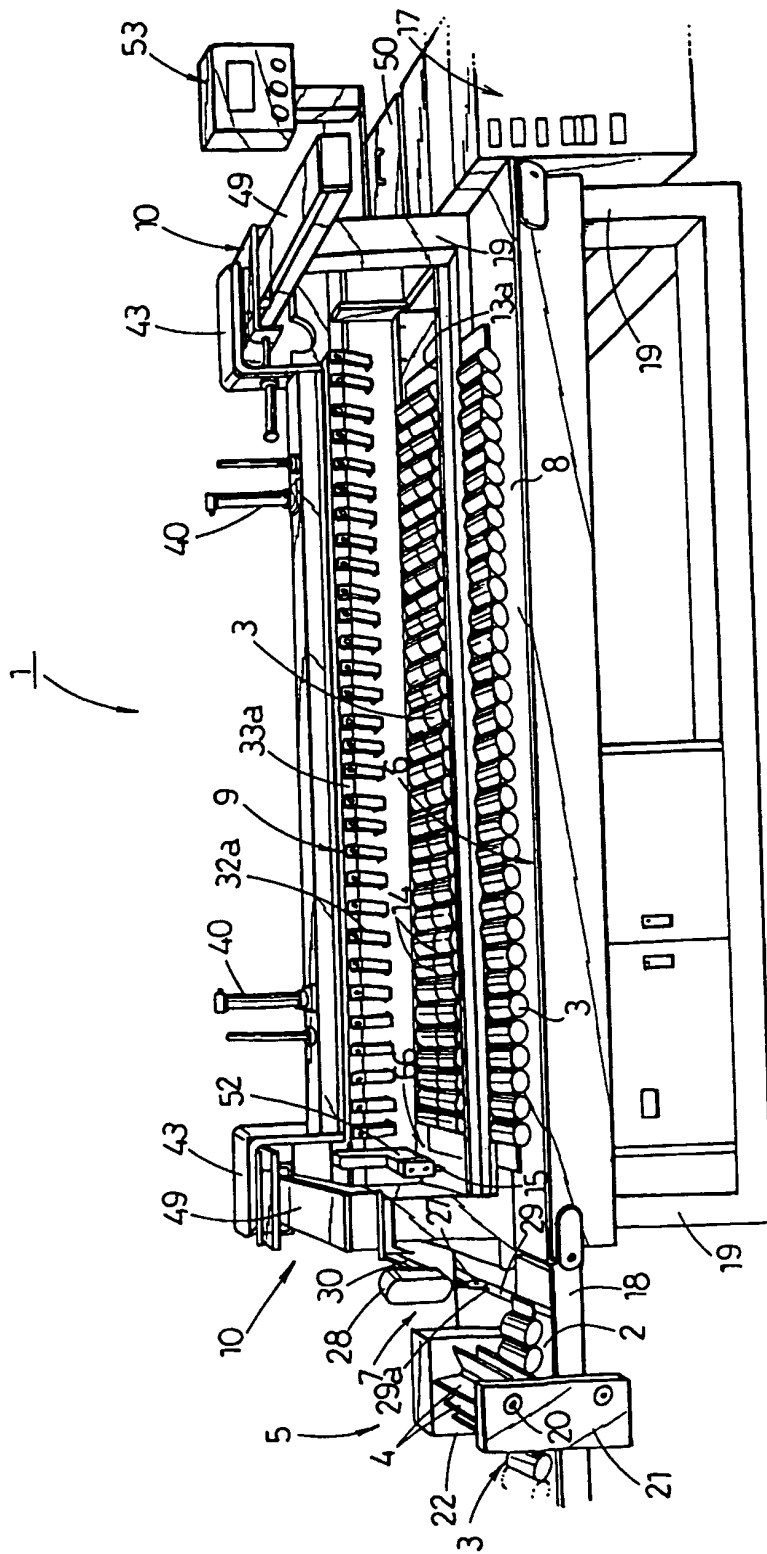


Fig.2

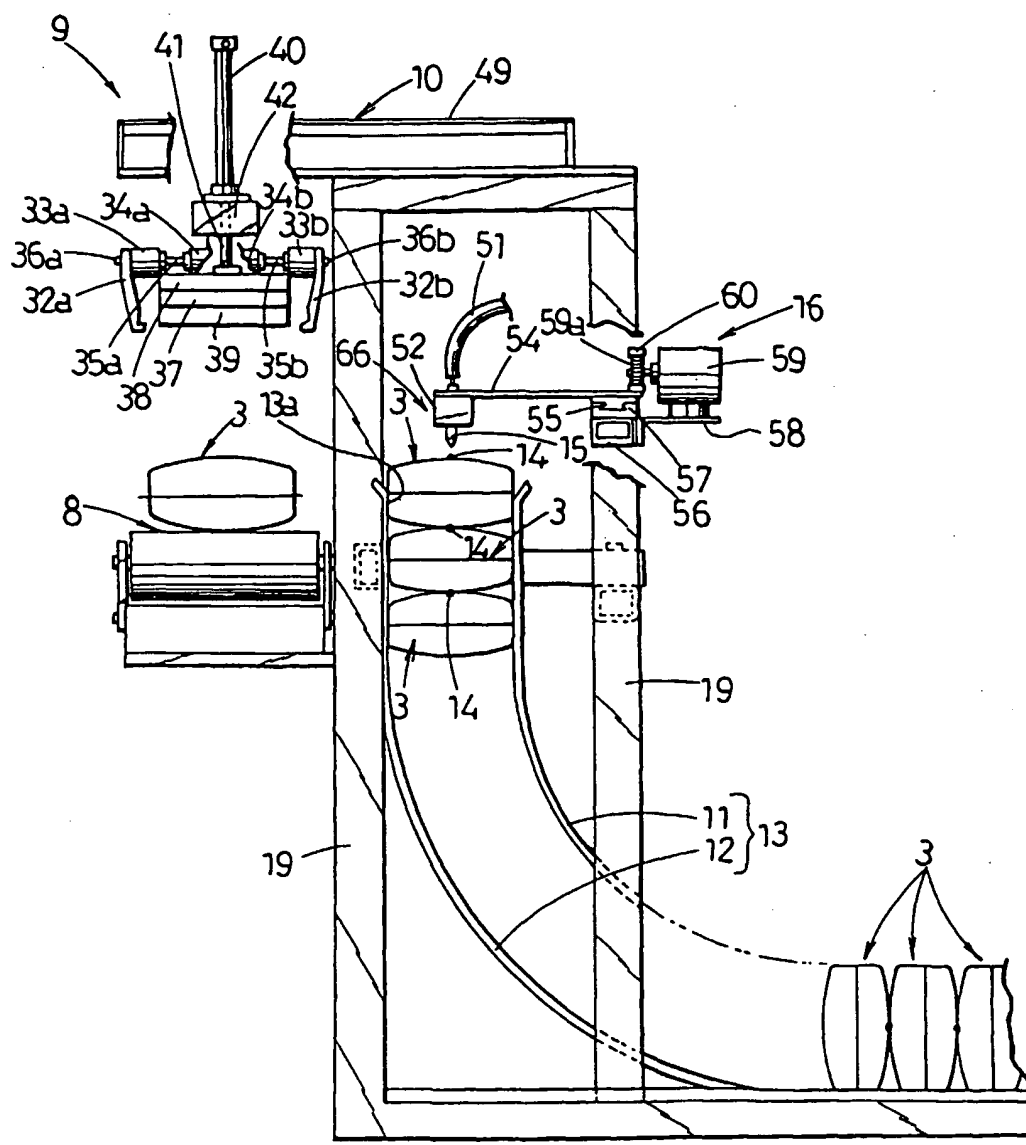


Fig. 3

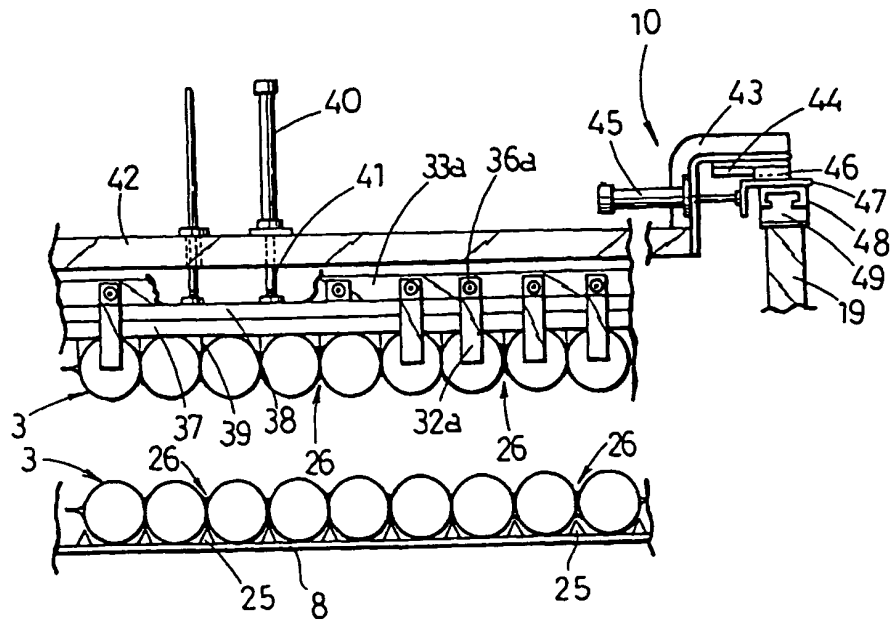


Fig. 4

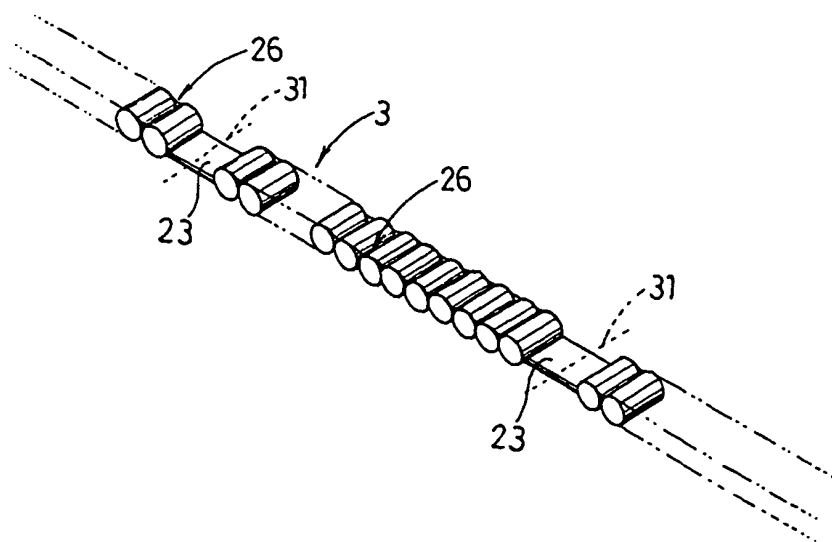


Fig. 5

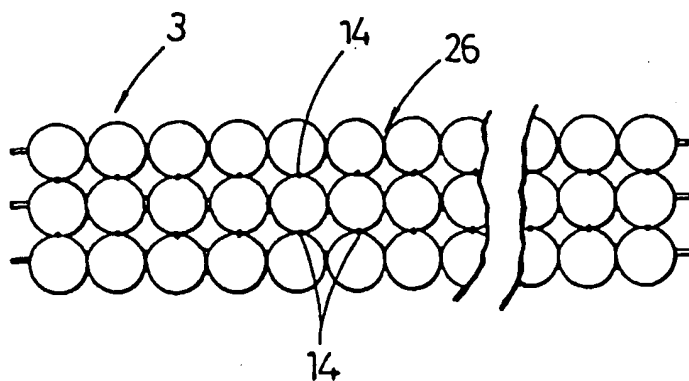
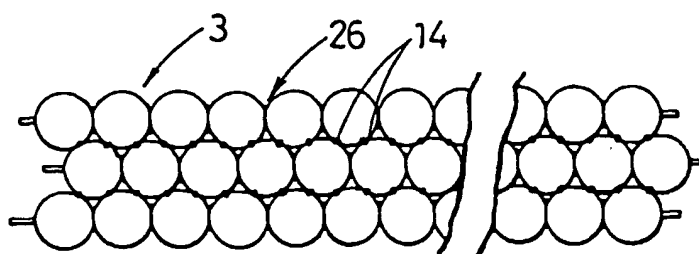


Fig. 6



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